

AN *17 Ma*
ESSAY

ON THE
Value of the Mines,
LATE OF
Sir Carbery Price.

By *WILLIAM WALLER*, Gent.
Steward of the said MINES.

Writ for the private Satisfaction of
all the Partners.



LONDON:
Printed in the Year, MDCXCVIII.

AN
ESSAY

ON THE
Value of the Mines
IN THE
SILVER MOUNTAINS
OF THE
SOUTH OF ENGLAND
BY
SIR CAMPBELL PRICE.

BY WILLIAM KENTON
STEWART, ESQ.
For Banks

NO. 11, 105, THE PRINCE OF WALES, LONDON.

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LONDON:
Printed in the Year, MDCCLXXIII.

THE
Epistle Dedicatory

T O

S^r HUMPHRY MACKWORTH,
CHAIRMAN,

And now Standing in the Place of ED-
WARD PRICE, Esq; and late of
Sir CARBERY PRICE;

AND TO

The most Noble, his Grace, the
Duke of LEEDS,

The Right Honourable the Mar-
quess of CARMARTHEN,

The Right Honourable *Parlet*,
Earl of BULLINGBROOK,

The Right Honourable *James*,
Lord Viscount LANESBOROUGH,

The Epistle Dedicatory.
The Right Honourable *William*,
Lord Digby,
The Honourable Sir *Humphry Ed-*
win, Knight, Lord Mayor of
LONDON,
The Honourable *Harton Compton*,
Esq;

AND TO

The Honoured, the Lady *Ann Cholm-*
ley, Mrs. *Mary Cholmley*, Mrs. *Bridget*
Pesball, Mrs. *Jane Bickerstaffe*, Mrs. *Ann*
Hill, Mrs. *Elizabeth Lloyd*, Widow,
Mrs. *Eliz. Lloyd*, Spinster, Mrs. *Lu-*
cy Wright;

AND TO

The Honoured Sir *Thomas Mackworth*,
Barr. Sir *John Prite*, Barr. Sir *John*
Morden, Kn^t. Sir *Charles Bickerstaffe*,
Kn^t. Sir *Christopher Wren*, Kn^t. Sir *Paul*
Whitchcot, Kn^t.

AND TO

The Honoured *Edward Price*, Esq; *Hen-*
ry Farmer, *William Powell*, *Edward Ni-*
cholas,

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sholas, Bulkley Mackworth, Philip Bickerstaffe, Arthur Moore, Henry Lloyd, John Meyrick, John Pugh, James Blake, William Freeman, Samuel Trotman, William Nicholas, Joseph Short, Rich. Stephens, Geo. London, Hen. Simons, Hen. Grove, and Joh. Wodehouse, Esquires ;

AND TO

Mr. John Oldbary, Thomas Phips, Senior, Paul Docminique, Whitfield Hayter, Anthony Forty, William Wolley, Thomas Phips, Junior, Richard Chancy, Richard Curtis, Thomas Fredericke, Gabriel Glover, John Glover, Thomas Jeeve, John Thrale, Nathanael Troughton, John Newland, John Preston, Edward Grace, John Hayword, James Hallet, Merchants, present PARTNERS of the said MINES.

HAVING had the Honour to be employed in the Management of these Mines, of Sir Carbery Price, for six Years last past, and being much concerned to see so great a Treasure lye dead and

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and unwrought, meerly for want of a Stock, and a right Constitution for the Management thereof; and finding some of the Partners unhappily engaged in Differences and Law-suits amongst themselves, and no probability of any Reconciliation, or the Works going forward, without the Assistance of some Publick-spirited Gentleman, who both understood the Art of Mining, and also composing of Differences; I thought it my Duty and Interest to make an Enquiry, if possibly I could find out such a Person, who would Purchase the Shares late of Sir Carbery Price, and heartily Engage for the Publick Good.

But when all the Qualifications are considered that were necessary to be found in one Person, upon this Occasion, I presume your Honors will
be

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be much enclined to believe, that I undertook no very easie Task.

For, when I met with an honest Gentleman, I generally found that he was very unskilful in Matters of this nature, and either unable, or fearful, to Engage in so great an Undertaking; and when I met with a Gentleman who had any Knowledge of these things, I presently perceiv'd that he was for grasping at all, and, instead of being willing to grant any thing for the publick Good, was still for getting more for his own particular and private Advantage.

So that, upon the whole Matter, I found that some had Money, but no Skill, others had Skill, but no Money; some again had both Skill and Money, (which was very rare) but yet wanted that generous and pub-

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publick Spirit that was necessary in this Case ; and where-ever I found a Person who was well disposed in the general, and well qualified in other Respects, yet he either wanted Courage to venture so great a Sum of Money, or Judgment to understand the present Constitutions of the Company, and how to amend them for the publick Good.

But at last, when I was, in a manner, in Despair, and had given over all hopes of Success, it was my fortune to Travel to Neath, in Glamorgan-shire, where I had the favour of being admitted to see the Copper-works and Coal-works of Sir Humphry Mackworth ; and having observed his new Contrivances in the Management thereof, which were more than I had seen before in any part of this Kingdom ;
and

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and taking notice of his Judgment in Matters of Law, and also of his frank and generous Disposition for the publick Good; and that he was by no means of a covetous or grasping Temper, but took delight in the Advantage he brought to others, especially the poor Miners and Labourers, as well as in the Gains he got for himself.

I presently concluded, that he was the fittest Person I knew, to set the Wheels a going with us in Cardiganshire; and, I humbly conceive, your Honors would all be of the same Opinion, if it were lawful for me to discover the several Improvements I observed at his Works, many of which being yet kept as Secrets, I must forbear to mention.

But his new Method of Coffering out the Water from his Shafts and

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Sink-

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Sinking-pits, and thereby preventing the Charges of Water-engines, and also recovering a large Vein of Coal by that means, which was in vain attempted by other Artists; and his new Sailing-waggons, for the cheap Carriage of his Coal to the Water-side, whereby one Horse does the Work of ten at all times; but when any Wind is stirring (which is seldom wanting near the Sea) one Man and a small Sail does the Work of twenty, (which are publick,) do sufficiently shew what his Genius is capable of in Matters of that nature.

And, I believe, he is the first Gentleman, in this part of the World, that hath set up Sailing-engines on Land, driven by the Wind, not for any Curiosity, or vain Applause, but for real Profit, where-
by

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by he could not fail of Bishop Wilkins's Blessing on his Undertakings, in case he were in a Capacity to bestow it.

But I must beg leave, not only to mention these things, (which (how-ever others may justly Value) I know he is pleased to esteem but as accidental Trifles that fell in his way) but also to take notice of his prudent Methods, for reducing all his Undertakings to a Certainty, free from Hazard; his Copper-men working by the Tun, and his Colliers by the Weigh, at a certain Price, which is constantly and punctually Paid; whereby, as no Fraud can happen to himself, without a Combination of all, so good Encouragement is given to the Workmen, to be Careful and Industrious, for their own Interest as well as their Ma-

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sters, not to mention the convenient Scituation of his Copper-work, which is such, that his Men may run the Coal, with Wheel-barrows, into the very Furnaces, and bring the Oar by Water within a Stone's cast of the Work; nor his Prudence, in securing Partners who had quantities of good Copper Oar to be smelted with his own Coal, before he began his Copper-work, whereby the Necessity of raising a great Stock, keeping many Agents and Stewards, at great Salaries, in several Counties, and great Hazards of bad Bargains, and bad Oar, with many other Inconveniencies incident to other Undertakings of that kind, were all prevented, and not only a great Profit made of the Copper, but also a great Vent secur'd for his own Coal, both at home in
his

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his own Copper-work, and also abroad in the West of England, in exchanging Coal for Copper Oar.

In all which, and in many other Respects, which will hereafter appear, such Management and Conduct may very well be admired, especially in a Gentleman that was bred up another way.

But I dare not express the Honour and Esteem I have for this Gentleman, for fear of giving Offence, and therefore I have only hinted at these things at present, for my own Vindication, that your Lordships and all the Partners may know the true Motives that induced me to labor for this Revolution, and to bring in Sir Humphry Mackworth to be so highly concerned in these Works, for the common Good of all the PARTNERS, as well as my own,
and

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and all the Agents employed under them.

It was for this end I first communicated these Thoughts to Mr. Price, and Mr. Powel, in the Country, who knowing these things to be true, and being extreamly pleased with my Proposal, ordered me to proceed therein, which accordingly I did, and having now spent near a Year's Time about it, and at last happily effected my Design, to the Satisfaction of all Parties.

I humbly hope your Honors are, or in a short time will be of Opinion, when your Term is lengthened, and your Constitutions settled to your own Content, that I have not mispent my Time in your Service.

I must confess that nothing ever troubled me so much, as the Misfortunes I labour'd under on the account
of

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of these Mines: That I should leave my own Habitation, and so many Works in the North, (in all which I had been fortunate even beyond expectation) and come so far into a strange Country to lose my Labour, and when I had got Mines under my Management of so great a Value, my Hands should be tied up, by unhappy Differences, from either making Profit to you or my self; and, at last, that it should be recorded in History to all Posterity, That the richest Mines, of that kind, in these three Kingdoms, and perhaps in all the Christian World, lay dead and unprofitable, for so many Years, during my Stewardship; whereas if these Mines had been carried on with a large Stock, and to the best Advantage, they might by this time

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time have raised the Fortunes of all the Partners concerned, and been as famous in foreign Countries, as most other Mines in the World.

When I first viewed these Mines, and undertook this Employment, I freely offered (for the Encouragement of all the Partners) to take my Salary out of the clear Profits, but I always apprehended, that I was not to Suffer for any other Person's Default but my own; and, on that account, I am so far from repenting of my Bargain, that allowing one Year to put the Works in order, and assuring me of good Management for the future, I shall be ready (instead of 250 l. per Ann. present Salary) to take 100 l. for every 10000 l. a Year clear Profits, which shall accrue from these Mines to your Treasury, over and above all

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all and all manner of Charges and
Expences whatsoever.

My LORDS,

I have at my leisure Hours, and
for want of an Opportunity of doing
your Lordships and your Partners bet-
ter Service, considered the Profits,
that are usually made of other Veins,
both at home and abroad; especially
in the North of England, where I
am best acquainted, and have com-
pared the Charges and Profits there-
of, and of these Mines together,
and the vast Advantages these
Mines have above any of them,
which I did at first for my own
private Use.

But being now advised, that it
would be a great Satisfaction to
your Lordships, and all the Part-
ners,

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ners, to have a more large Account given of these Mines, and that your Lordships are desirous to know my Reasons for setting the same at such a Valuation, upon which your Lordships, and all the Partners, may be capable of being the best Judges of the Value thereof your selves, I have therefore humbly presumed (tho' a Person otherwise very unworthy to appear in Print) to publish this following Essay on the Value of these Mines, for your Lordships particular and private Satisfaction.

And lest it may be thought I have writ this for any particular Advantage to my self, or to encourage others to any Undertaking, in which I durst not venture my own Bottom, as well as theirs; I humbly beg leave hereby to offer to your
Lord-

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Lordships, and all the Partners,
that I shall be ready at all times
to accept of Shares for my Salary
at the highest Rate that was ever
yet given for them.

Provided always that you agree
together to settle a good Constitu-
tion for the Management thereof,
and to raise a competent Stock pro-
portionable to so great an Under-
taking, to which I am also willing
to lay down my Proportion, and stand
or fall by my former and present
Valuation.

For tho' I am sensible the same may
seem very high, and almost incre-
dible to others, who do not know the
Advantages of these Mines, or be-
lieve that they are so large as they
are described; yet, to my self, who
have spent so much Time, and ta-

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ken so much Pains to consider of it, and take the exact Measures of them, I have great reason to believe (taking one thing with another) that I have rather set them below, than above, the real Value.

For, First, The Price of the raising the Oar, in the great Vein, is set at fourteen Shillings and Threepence per Tun, in the last Valuation, which is much higher than it will really cost when the Levels are carried home.

Secondly, The five lesser Veins of Lead are set very much below the real Value, if managed with a large Stock.

Thirdly, The Copper Veins would employ a much greater number of Men, with brisk Management :
And, Fourth-

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Fourthly, *The Profits of the Silver (which may probably amount to the Value of all the rest) is not computed at all, but only mentioned in general Terms.*

And, as to the largeness of the Veins, there are several Gentlemen, now in Town, who have been in that Country (viz.) Dr. Thompson, Minister of Friday-Church, Mr. Phips, of Clerkenwel-green, Mr. Hoile, in the Still-yard, Mr. Duckett, in the Strand, near Exeter-Change, and several others.

Who, I suppose, will all own I ever represented, those Veins they took the trouble to view, (which were only the great Vein, and the Bog Vein) rather less than greater.
than

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than they really were; but, at that time, I had not discovered the two Copper Veins, nor the Richness of the five lesser Lead Veins, which now make your Honors Interest of double the Value it was in the Year 1693.

And therefore since your Honors are now like to have the Advantage of my Labours, and new Discoveries; and, since I have been the Instrument (under Providence) of bringing in a Gentleman to redress your Grievances and encrease your Term, I can never doubt, having Right done me at your Hands, nor the Works being carried on to the best Advantage.

And, for my part, your Honors shall all find, that I stand upon an honest

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nest Bottom, and That the common Good of all Parties concerned, is all that is desired, by

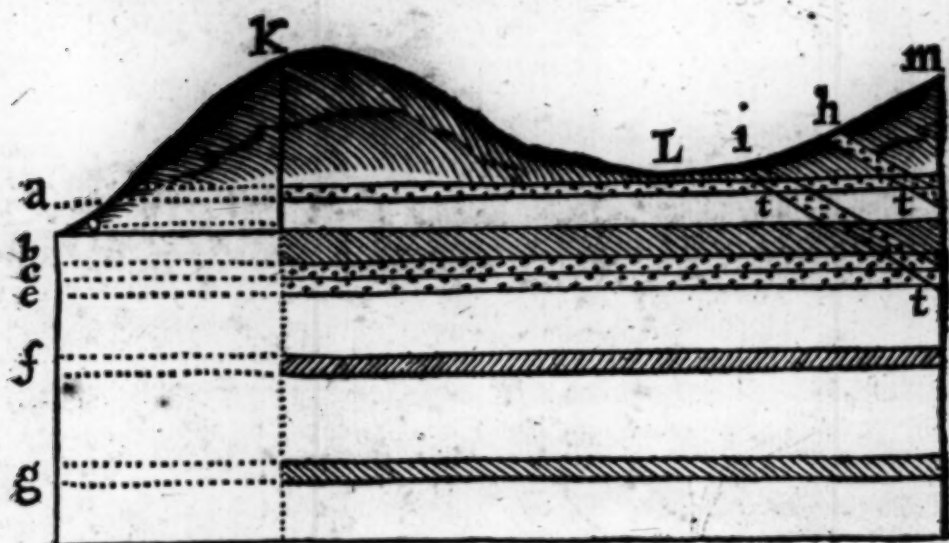
Your HONORS

Most Obedient and most

Humble Servant,

WILLIAM WALLER.

*A DESCRIPTION of the Silver, Lead and Copper-mines,
late of Sir Carbery Price, lying in Cardiganshire, within four
Miles of the Navigable River Dovey, and from thence a Mile by
Water to the Port of Aberdovey, where Vessels of three or four hun-
dred Tuns may ride with great Safety.*



- | | |
|---|--|
| <p>a The North Vein of Lead-ore, three Foot wide.</p> <p>b The great Lead-vein, eleven Foot wide.</p> <p>c A Vein of Lead-ore six Foot wide.</p> <p>e A Vein of Lead-ore three Foot wide.</p> <p>f A Vein of Green Copper-ore, four Foot wide, and yields three Tun of Copper from twenty Tun of Ore.</p> <p>g The Bog-vein, four Foot wide, all Potter's Ore.</p> <p>i The Cross Vein of Lead-ore, three Foot wide.</p> | <p>i The Cross Vein of Brown Copper-ore, five Foot wide, and yields five Tun of Copper out of twenty Tun of Ore.</p> <p>k The first great Shaft and Western Boundary.</p> <p>l The East Level.</p> <p>m The Eastern Boundary.</p> <p>t t t The places where the Cross Veins meet with the other Veins which are called by Miners (T) of the Veins, and are reckoned the richest part of them.</p> <p>o The West Level.</p> |
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Note, All the said Veins are fix'd and settled betwixt firm and solid Sides, and rise equally near to the Surface of the Ground; and all (except the Cross Veins) lie parallel to the great Vein, descending downwards like the Mine of Potozi; but being many in Number, and crossing each other could not be better described together on Paper.

The Scale for the Length four hundred Yards in an Inch; and for the Height of the Mountain eighty Yards in an Inch; and for the Distance between the Veins forty Yards in an Inch.

[1]

A N
ESSAY
ON THE
Value of the Mines,
L A T E O F

Sir *CARBERY PRICE.*

WHAT great Advantages have been made from Mines and Minerals in all Ages, is a thing so well known, that it will be altogether unnecessary to enlarge upon it, being generally admitted in all Countries abroad, and even at home in this our own Nation, where many great Families have been raised, or much enriched by them, besides Artificers and Tradesmen; and where a vast number of poor People live thereby,

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the

the very Women and Children finding Employ therein, as well as the Men, especially in the Mines of Lead.

The Ingenious Mr. Carew, in his Essay on the State of *England*, in relation to its Trade, its Poor, and its Taxes, hath this Expression, Viz. *Nor is this all the Product of our Earth, whose Womb being big with Treasure, longs to be delivered, and after many Throws, brings forth Lead, Tin, Copper, Calamy, Coal, Culm, Iron, Allom, Copperas and sundry other Minerals; which return us great Treasure from Foreign Markets, whither they are exported.*

And Sir *Josiah Child*, in his Judicious Discourse of Trade, tells us, 'That our Lead and Tin, which are Natives, and by God's Blessing, inseparably antex'd to this Kingdom, carry on much of our Trade to *Turky, Italy, Spain and Portugal*; besides great Quantities that are sold to *Holland, to France, and to the Indies*, as is well known to all Merchants that trade to those Parts.

But yet many Gentlemen have been much discouraged of late from laying out their Money upon Mines, by reason of several Disappointments that they have met withal; some of which were occasion-
ed

ed by the Ignorance of common Workmen, mistaking the Sprigs of a Vein for the main Body, which yet an experienced Artist can easily distinguish at first sight. Some by the Knavery of Miners who have lodged a quantity of Oar in a Shaft or Drift so artificially, as might deceive an ordinary Spectator. Others again have been defeated in their Expectations, when they have had a good Vein, either by paying too high a Duty to the Lord of the Soil, clear off all Charges, or else for want of a sufficient Stock to carry on their Works; for when the Proprietor is not able to make a just and punctual Compliance in his Bargains and Payments, and raise a Stock of Oar beforehand, that Work must needs stop before it's brought to Perfection, and so like an House unfinished, and without a Cover, must necessarily fall together into Ruine and Confusion; or at least the Proprietor must comply to such unprofitable and disadvantageous Bargains, and submit to so great Expences for want of convenient Levels to carry off and drain the Water from the Works, as will render his Designs fruitless, and the richest Treasure of that kind unprofitable.

And therefore whoever will begin a Work of this nature, must first consider the necessary Charges of making the Levels, Adits, Shafts, Smelting-houses, &c. and whether he hath a Stock sufficient for all these things; and thereby to lay a right and sure Foundation for so great an Undertaking: For if he hath not, all his Mony expended will be lost, and in a manner thrown away; but on the other hand, where such large Veins of Lead and Copper-ore are actually found fixt and settled betwixt their firm and solid Sides, (as these are) the Lord's Duty bought off, and a competent Stock first raised to carry on the same with Effect, and to the best Advantage, there the Profit is vastly great, and as certain as any Estate in the World: No Man living ever finding the Bottom of such Veins, or failing of great Profit, till the Works are wrought so very low beneath the Levels (which in this Case must be in the next Age) that the Water grows too hard for them.

There are in the North of *England* many rich Mines discovered; but there is none either in *England* or *Wales*, that can pretend to come near the Value of
the

the famous Mines of Sir *Carbery Price*: I have not read or heard of such a Mine of Lead in all the World, as the great Vein, which is eleven Foot wide betwixt its firm Sides, and seven Foot and a half already in pure Oar, which still encreases downwards; and 'tis not doubted but at last it will come to be eleven Foot wide in Oar. And I humbly conceive, I may confidently affirm, That no History hath yet given us an Instance of so many rich Mines, both of Lead and Copper, lying so near together; And really I cannot but think it is a great Pity and Loss, not only to the Owner, and to that County, but even to the whole Nation, that so great a Treasure should lye dead and unwrought, meerly for want of a right Understanding thereof. (also - given)

And therefore I have undertaken, with all Submission to better Judgment, to give my Opinion of the VALUE of the same; In doing of which, if I seem to any Person to exceed beyond the Bounds of a moderate Valuation, yet since I have wrote nothing but what I firmly believe, and durst venture my own small Fortune in the World upon it; I humbly hope the candid Reader will not be offended with me

me for only offering such Reasons to his Consideration, as by long Practice and Experience in the Mining-trade, hath induced me to be of that Opinion ; in which I desire to be understood aright : And therefore my Valuation doth always presuppose that the Mines are purchased free from any Duty to the Lord of the Soil, and that a Stock of 20000 *l.* be raised, whereof some part to be employed for making the Levels, Adits, Shafts, Smelting-houses, &c. and raising several Stages or Stelches, for a Number of Men to be employed together (at which time the Work will be clear of all Obstructions from Water, and two Men by blasting upwards with Gun-power, will get more Oar, than six can do now with their Working-tools) and that the Residue thereof be employed in raising a Stock of Oar before-hand ; and also that a Year's time be allowed for putting the Work in Order, and even then (though a very considerable Profit will be made) yet it is not pretended, under some Years more, to bring the Works to the highest Valuation, And this being premised, I observe, First,

That

That in the Year 1693, before the Copper-mines were discovered, Sir Carbery Price having recovered his Right from the Patentees of Royal Mines, divided his Interest therein into 4008 Shares, whereof each Share was valued and sold at 17 *l.* per Share; and for the other Moiety he was afterwards offered 40000 *l.* by an eminent Merchant in this City, to be immediately paid down; which he refused for this Reason, that I had then demonstrated to the said Sir Carbery, and his Partners, that with a sufficient Stock he would be able, in a few Years, with six hundred Men, to bring in a clear Profit from one of the said Veins, of 70500 *l.* per Annum; as by a Paper printed in the Year 1693, may appear, and herein set forth, as followeth, *viz.*

Six

Six hundred Men employed at
 the great Work, when the
 Levels are up, at 8 s. 6 d. per
 Tun, for Getting, Washing,
 and Making Merchantable,
 as it is now got, every two
 Men must get above a Tun by
 Week to make them Wages; } 06375
 but at the rate of one Tun a
 Week, the six hundred Men
 will raise three hundred Tuns
 by Week, and at fifty Weeks
 fifteen thousand Tuns by the
 Year; this Charge of getting
 is }
 Carriage to the River *Dovey* at } 03750
 5 s. per Tun }
 12 d. per Tun by Water, and
 for Landing it into the Store-
 houses at the Port of *Aberdo-* } 00750
vey }
 Fifteen thousand Tuns of Oar
 will make ten thousand Tuns
 of Lead, smelting of this when
 our Mills are up, at 15 s. per
 Tun } 07500

Charges 18375

Ten

Ten Thousand Tuns of Lead,	}	90000
at 9 <i>l.</i> per Tun		
Charge of getting, washing, and	}	18375
smelting		
Sinking Shafts, and incident	}	1125
Charges		
		<hr/>
Clear Profits		70500

Some Gentlemen have condemned me very much for giving in such an Account, as believing this was a greater Product than can be raised from any Mine in the World; but, underfavour, this will appear a great Mistake on their side, not only from a plain Demonstration of the thing, as aforesaid, but from common Experience in other Mines, both at home and abroad.

As, First in *America*, The famous Mine of *Potozi* is a sufficient Instance to the contrary; and therefore I have here inserted a Map thereof,

Vid. The original Map in Copper by P. Lee at the end of this Cheap side.

Place the Map of *Potozi* in the Page following.

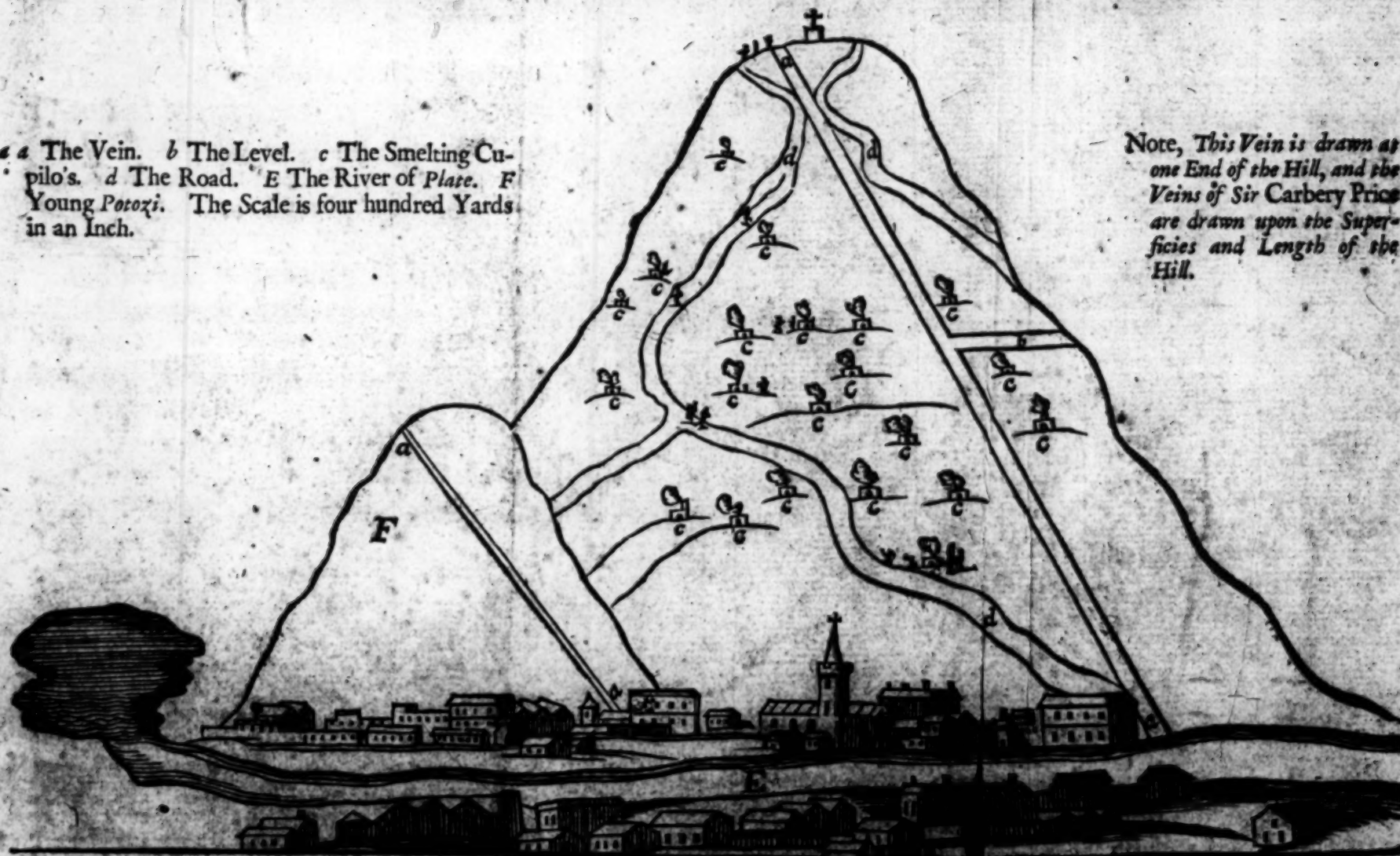
*A Description of the Mine of Po-
tozi.*

THIS Mine lies in the Country of *Chorcas*, in a Province of *Pera*, Seventy Leagues from the Sea, within the Tropicks, in Twenty one Degrees of South Latitude, and was discovered in 1546. From this great Vein, which is about Six Foot wide, doth issue out some small Sprigs of little account; and yet here they Refine Thirty eight Millions Five Hundred Thousand Pound weight of Silver yearly, one Pound weight of their Oar yielding one Ounce of fine Silver, at which rate, they must raise in Oar yearly Two Hundred Fifty six Thousand Two Hundred Fifty Tuns, before they can answer that Account in Silver; but, by *Gerard Molino's* Account, they must raise a great deal more. The great Vein runs directly North and South, sloping in the Hill: They have made a Level which they were 22 Years a driving, but, being very crooked and running far under Ground, they carry up their Oar on their Backs, each Man about

The SILVER-MINE of POTOZI.

a a The Vein. *b* The Level. *c* The Smelting Cupilo's. *d* The Road. *E* The River of Plate. *F* Young Potozi. The Scale is four hundred Yards in an Inch.

Note, This Vein is drawn at one End of the Hill, and the Veins of Sir Carbery Price are drawn upon the Superficies and Length of the Hill.



bout 50 l. weight, in Wallers, on Ladders made of Neats Hides, three and three in a row, one of the three having a Candle tied to his right Thumb, to give the rest light.

This Work employs above Twenty Thousand Miners, and is wrought Night and Day, above a thousand Yards deep: See *Acosta* in his Natural History of the *Indies*, and the History of the New World, by *N. N.*

And several Merchants, that have Travelled into those Parts, relate, That this Mountain, by reason of the numerous Smelting-houses built upon it, doth look at a distance as if it were all on Fire: And, That these Mines have been the occasion of building of a very fine Town, at the bottom of the Hill, called, The Town of *Potozi*.

Thus you see what great things are done at *Potozi* by the poor *Indians*; they can raise Two Hundred Fifty six Thousand Two Hundred Fifty Tuns of Silver Oar in a Year; and, yet in *England*, 'tis thought a Fiction and a Romance, and, by some, a meer Cheat to draw in Persons, to speak of raising but Fifteen Thousand Tun of Oar in a Year. I could hear-

tily wish, for my Country's sake, that these Mines were as rich in Silver as that, I should never doubt, but in a reasonable time, to equal them in raising Oar, from Veins exceeding them in breadth and wideness, and in many other Respects, provided there were a Stock proportionable imployed in the working of them; for there that Mine is wrought a thousand Yards deep, here from the surface of the Ground; there they carry up the Oar on their Backs, in Wallets, as aforesaid, here with the help of a Windless, by which two Men can wind up more than twenty Men can carry on their Backs.

And therefore I hope, in every respect, it will be thought no Vanity to affirm, That we have as much Art and Ingenuity in *England* as any of the Workmen in *America*; and I doubt not, but in some Years, these Mines in *Cardiganshire*, will give occasion for erecting as large a Town as that at *Potozi*, which may deservedly be called by the Name of *Welsh Potozi*; and, one Advantage at least, these will have above *Potosi*, that whereas that Mountain is Seventy Leagues from the Sea, here the Proprietors, and Minors, for their Encouragement,

ment, may have the delightful Prospect of seeing the Ships sailing into the Port of *Aberdovey*, to bring them ready Money for their Commodities.

But, to come back into our own Country, there are several Works in the North that come up to this printed Proposal, considering the difference between the Veins; for the *Right Honourable the Earl of Darwenwater* hath, or lately had, Mines of Lead, in *Auston-moor*, in *Cumberland*, about Thirty Miles from the Sea, and made of his Duty (which is a fifth part of the Work) 12000 *l.* a Year. Another eminent Lord, in the North, from a small Vein of Lead, three Foot thick, doth, or lately did, clear 17000 *l.* a Year. Another noble Lord, from a small Vein, not two Foot thick, and thirty Miles from the Sea, doth, or lately did, clear above 7000 *l.* a Year, betwixt him and his Farmers, and several more such Veins there are in the North.

Now if these small Veins, whereof some of them are thirty Fathom deep before they come to the Oar, and so far from the Sea, can make so great a Profit clear above all Charges, What must those Mines yield, whereof one Vein is so large

as

as aforesaid, and the least as big as any of them in the North, especially when the Levels are made in a cheap Country, and so near the Sea: But the Advantage of these Works may farther appear, by an Essay on the Value of the Works in the North, and these compared together, as followeth.

A

A small ESSAY, by a Medium of Prizes, as Oar is got in the North, and in Wales at Eskirhir, compared together.

THe raising Fifteen thousand Bing of Oar, at 15 s. per Bing, which is the middle Price between 10 s. and 20 s. per Bing, amounts to

l.
11250

Note, That two Bing and one half is one Tun of Lead.

Tun of Oar; but 4 Bing is allowed to make a Tun of Lead.

The Duty allowed to the Lord is $\frac{1}{2}$ Share and a half, being a Medium betwixt a 10 and a 5 Share, but I'll admit a 7, and that amounts to 2142 Bings, and $\frac{1}{2}$ but I'll admit of one Bing more, which makes 2143 Bings, which being deducted out of 15000 Bings, there remains 12857 Bings, which, at 4 Bings to a Tun, will yield 3214 Tuns and $\frac{1}{2}$ of Smelted Lead. The Charges of Smelting thereof at 15 s. per Tun, amounts to

l. s.
2410 10

The

[16]

The incident Charges is accounted one third of raising the Oar, being their Shafts are so very deep, and at that rate amounts to

l.
3750

The middle Price for Carriage to the Water-side, between 20 s. and 34 s. is 27 s. per Tun, which, for the said 3214 Tun of Lead, will amount to

l. s.
4338 18

Charges 21749 08

Let the Price for Lead, in both Essays, be supposed to be 10 l. which for 3214 Tuns, will amount to

l.
32140

Out of which the whole Charge aforesaid being deducted, there remains clear Profits

10390 12

Now

Now view this Account turned to *Eskirbir* Account, and charged accordingly at a middle Price, as Oar is now raised before the Levels are made.

The raising Fifteen thousand

Bings of Oar, at 5 s. 8 d.

Half penny per Bing, which

is 14 s. 3 d. per Tun, which

is the middle Price betwixt

8 s. 6 d. and 20 s. per Tun,

doth amount to

l. s.

4281 5

This Oar will yield Three

thousand seven hundred fifty

Tuns, being Five hun-

dred thirty six Tuns more

than in the former Essay,

by reason here is no Duty

paid out to the Lord. The

Charge thereof for Smel-

ting, at 1 s. per Tun

Sinking Shafts, &c. being it

lies so near the Surface, is

one fourth of raising the

Oar.

The Carriage of Three thou-

sand seven hundred fifty

Tuns by Land, 5 s. and by

Water 1 s. in all 6 s. to the

Port *Aberdovey*

2812 10

l. s. d.

1070 6 3

1125 9 6

D

Three

[- 18]

Three thousand seven hundred fifty Tun of Lead, at the supposed Price of 10 $\frac{1}{2}$. 37500
per Tun, amounts to

Clear Profits 29335 18 9

NOTE, That in the first Essay of Works in the North, it appears by Computation, That Seven hundred and fifty Men must be employed for the raising of the said Fifteen thousand Bings of Oar, allowing 6 s. per Week Wages for every Workman; now, if the same number of Men, and at the same Wages, be employed at *Eskirhir*, they will raise Thirty nine thousand four hundred and sixteen Bings, by reason the great Vein is so much larger, and the Oar is raised at so small a Price as 5 s. 8 d. $\frac{1}{2}$ per Bing, which proportionably to the first Essay, being four Bings to a Tun, makes Nine thousand eight hundred fifty four Tuns of Lead; but this last Essay cannot be fully perfected, without showing more at large what Difference it makes, by employing Seven hundred and fifty at *Eskirhir*.

Seven

Seven hundred and fifty Men
must raise Thirty nine
thousand four hundred and
sixteen Bings, to make their
usual Wages, to every Man,
of 6 s. per Week, at 5 s. 8 d.
per Bing. This Charge
amounts as before to

11250

This Oar will yield Nine
thousand eight hundred
fifty four Tuns of Lead,
which, at 16 s. per Tun
Smelting, is

7390 10 6

Carriage by Land 5 s. and
by Water

2956 4

Sinking Shafts and incident
Charges

1070 6 3

Charges 22667 0 3

Nine thousand eight hundred
fifty four Tun of Smelted
Lead, at 10 l. per Tun, is

98540 0 0

Clear Profits 75872 19 0

D 2 So

So that hereby it plainly appears, That the same number of Workmen that bring in a Profit of 10399 $\frac{1}{2}$ 10 s. in the Works of the North, being employed in the great Vein above described, would bring in a clear Profit of 75872 $\frac{1}{2}$ 19 s. 9 d. per Annum.

It is farther objected by some, That so great a number of Men cannot be employed in any one Work, and though all the other parts of the Calculation must be allowed to be true, yet it will fail in that Particular.

Ans. That in Arkendale Works, in Yorkshire, which is a small Vein, about two Feet wide, there was Six hundred Men employed at three Shifts, Two hundred Men at a Shift every eight Hours, and only one Man in a Breast, whereas this great Vein employs six Men in a Breast, on every Stage or Stool, and more Stages can be raised there than could be done in Arkendale Works. And in the Work of my Lord Darwenwater was employed above a Thousand Men. In Cornwall, and some of the Tin Works, employs above Fifteen hundred Men, and in Germany they employ a greater num-

number, and so in *Sweatland, Hungary, Poland, &c.* but in the *West-Indies* Ten thousand, and in some Mines above Twenty thousand Men are employed in a Work, as at *Potozi* aforesaid, and even in these very Works, in *Esqui-*

Wind-
chalhr Mine
in Hunga-
ry, employs
2000 Men.
Vid. Browns
Travels, p.
90.

bir in ten Yards space, at three Shifts, every eight Hours, was employed eighteen Men at a Shift, Fifty four Men in every Twenty four Hours; and, with a reasonable Stock, twenty such Distances may be made, which will employ, at the same rate, above a Thousand Men.

But this is a new Discovery, and, consequently, cannot succeed in the first Adventurers Hands. The Truth is, That the Profit appears so very considerable, that tho' there is nothing of any moment to be objected against it, yet the greatness of the thing makes it seem improbable; For, by they, such a thing was never heard of in *England*, therefore it is impossible it should ever happen. This is the force of the Objection, but, as there is a Reason offered, so let Reason be opposed, and then the Matter will come to a fair Determination; for the very same Objection was made against the Project

of

of

of the New-river Water, where a Share was said to be valued at first at no more than 100 *l.* soon after at 500 *l.* and afterwards Thirty six Shares were sold for One hundred and fifty one thousand Pounds, to *Simon Middleton*, a Merchant, and the whole Interest of the New-river Water is valued at this Day at 300000 *l.* at the least.

The General and Penny-post Office were at first esteemed as meer Projects, and slighted in the beginning, and yet came afterwards to be of great Value; and these things, though demonstrated at first, yet were not believed, and no Reason could be opposed, but only the greatness of the Proposal made them seem improbable.

And though every new Trade and Voyage, the Merchant contrives, is at first a Project, and so by consequence, the Trade to the *East-Indies*, *Turky*, *Africa*, and *Hudson's Bay*, &c. were meer Projects in the Original, and tho' the first beginning of these Mines might be said to be a Project, in some Respect, by reason of the uncertainty, before they had found the Veins; yet I cannot now allow, that there is any thing in this Undertaking,

dertaking, that so much as looks like a Project, since every thing is reduced to a certainty before-hand, the Veins being long since discovered, fixed and settled betwixt their firm and solid Sides, many hundred Tuns of Oar got out of them, till the Water grew troublesome, and the Partners could not agree to raise a sufficient Stock, for bringing up a Level to drain the Water from them; but if a Man has a thousand Acres of the richest Meadow-ground, and has no stock of Cattle himself, nor will buy a stock, or rent the same out to others that have one, all that rich Land must lie dead and unprofitable, and yet without any Disparagement to the Goodness of the Land; so if a Man has the richest Mines in the World, even *Potosi* itself, and yet is not willing himself to raise a competent Stock to make Levels, &c. and carry on the Works, nor will part with them to others that are; he can expect no Profit from them, though ever so rich and profitable in their own Nature; and this Accident does not lessen the intrinsic Value of the Mines to Men that have both Stock and Skill to manage them.

And

And to such it is not doubted, but these Mines, in a few Years, will be worth above a Million of Money: For, to return, if this great Vein will yield so much alone, What will all the other Veins yield, which are five in number? Besides the two Copper Veins; and, taking one with another, more large than any in the North; but if my Lord *Darmanwater* received 12000 *l.* a Year for a fifth Part of a Work, I hope I may modestly compute every one of the five Veins at 12000 *l. per Annum* each, for the whole Interest thereof, (there being no Duty to be paid to the Lord of the Manor) which in the whole, is 60000 *l. per Ann.* more. And so much for the Lead mines only.

As to the Copper Mines,

IT appears by the Map, that one is four Foot wide, and the other five Foot wide, betwixt their firm Sides, which are very great Veins of that kind, and the like scarce known in these Parts; and though they are not carried on to any deepness, the one being found at three Yards, and the other at fifteen Yards deep, and are yet mixt with Vein-stone, and so not come to the best Oar, which, by the Course of such Veins, grow much more Rich as they take more Ground upon them, yet, at present, the one yields three Tuns of Copper out of twenty Tuns of Oar, which is better than one seventh; the other five Tuns from twenty, which is one out of four, as by frequent Trials has been experienced; and this sort of Oar smelts into malleable Copper, in one Furnace, at the first Running, inso-much that the Profit of these two Veins will be very great, whether sold by the Tun, or smelted into Copper, which may be computed thus:

*A Computation of the Value of the
Copper Mines.*

THese two Veins, will,
in a short time, em-
ploy at three several Shifts,
every eight hours,
several Hundred
Men; but I will
suppose but one
hundred Men in
each Vein, and the
Price of getting
the Oar at 20 s.
per Tun, though

Note. In
Kefwick,
in Cumber-
land, was
employed
4000 Men
in one Cop-
per Mine.
Sir John
Pettus, Fi-
dine Rega-
lis, p. 32.

3000

it may be got for less;
when the Levels are made,
these two hundred Men
to get their usual Wages,
must raise sixty Tun per
Week, which, at fifty
Weeks in the Year, is
three thousand Tun a
Year, and so the Charge
of raising the Oar is

This

This Three thousand Tun of
Oar, at one Fifth and a
half, being a Medium be-
tween a Seventh and a
Fourth, (but to give a
good Allowance, taking
one Sixth for the Common
Product) will yield Five
hundred Tuns of Copper,
which, at 20 l. per Tun,
for Smelting and Refining,
the Charges thereof will
amount to

Carriage of Five hundred
Tuns of Copper, to the
Port, at 6 s. per Tun
Sinking Shafts, and other in-
cident Charges

10000

150

750

The whole Charges

13900

Five hundred Tun of Cop-
per, at 100 l. per Tun, a-
mounts to

50000

Clear Profits

36100

E

Object

Object. That the most famous Copper-work in *England* does not make above two or three Hundred Tuns of Copper in one Year.

Ans. That in most other Works great part of the Oars there smelted, are sulphury Oars, and must be run through six or seven Furnaces before they can be refined into good Copper; but if the Managers of those Works had Plenty of such Oar as this, which runs into malleable Copper in one Furnace, they would make five hundred Tun of Copper more easily than they make two hundred Tun now.

Object. That the Charges of Smelting and Refining is too little in this Calculation.

Ans. That for Smelting and Refining sulphury Oars this may be too little, but for this ~~too much~~, this Oar not requiring above one fifth part of the Firing and Workmanship incident to the other, for the Reasons aforesaid.

Object. That to yield a Product from Copper-mines seems altogether improbable; that such a thing was never heard of, and that it is a great matter to make 10000 *l.* per Annum of one Copper-work.

Ans.

Ans. This is an Objection, but no Reason offered but want of a Precedent, which may be found in *Sweedland*, and *Hungary* and in many places, and when it is considered, that there is such Oar to be had in *Wales*, that yields so rich a proportion of Metal, and nothing can be said why so much Oar may not be raised every Year, when the Levels are made, which will yield so many Tun of Copper at such a Price, and when the vast Difference between these sorts of Oar, and the sulphury Oars is also considered, and how the Price of the latter is raised considerably of late, so that with the Charges for the sulphury Oar, for great Land-carriage, for great Quantities of Coal, for so many Smelters Wages to attend such a vast number of Furnaces as is used for such Oars, with the Reparations of the Furnaces, &c. It is well if 20 *l.* per Tun be got clear from that Oar; and, from this, 72 *l.* per Tun will be got clear, by the Owner thereof, by reason the Charges is so small, in all respects, as aforesaid: And so upon the whole Matter, the same Person may better make 36100 *l.* per Ann. clear of these Oars, presupposing them to be his own, as aforesaid, than 10000 *l.* per Ann. clear of

of the sulphury Oars, and buy both Oar and Coal, &c.

Thus much in general.

But here is one thing more particularly to be observed, That whereas six or seven thousand Pounds are laid out, in bringing up a Level to a single Mine, perhaps not so large as the least of these; here one Level, that will not cost near that Sum, by a cross Drift, will serve for most of those Veins, and thereby save a vast Sum of Money.

Object. That if these Mines were so rich as is pretended, it is not probable the present Partners, concerned therein, would let them lie dead and unwrought.

Ans. The present Partners want a Stock, and cannot agree in Ways and Means of raising of it; some are willing, but not able, others are able, but not willing, tho' they have frequent general Meetings for that purpose; some want Money, and yet are loath to part with their Shares under what they cost them; others have Money, and will not lay it down for those that have none, unless they can have a great Bargain; some

some again complain, that they are not right in their Constitutions, and will lay down no Money till these are rectified, and, whoever peruses the present Proposals, from the Committee, to Mr. Price, will see where the Fault lies, and, that neither side labours, at this time, under the least Apprehensions, that the Mines will not answer their utmost Expectations, if they had a sufficient Stock to make the Levels, and carry them on.

Object. Now, upon the whole Matter, the only Objection that seems to be left is this, That Mines, under Ground, are uncertain things, and, if they should happen to fail, then all the Money laid out upon them will be lost, and, tho' they should yield good Oar, yet they may not last out half the Term.

Ans. The Terror of a Royal Mine has long kept a great part of this Nation in Ignorance, or else this Objection would never be made; for in *Sweedland, Denmark, Germany, Poland, and Hungary*, and even amongst the barbarous *Indians*, where the mining Trade is encouraged, it is well known, That Nature is regular in its Productions under Ground as well as above, inasmuch, as the Knowledge

ledge of these things is become a Science, and many learned Volumes, in several Languages, by *Agricola*, and others, have been written on that Subject.

The Inhabitants of *Cornwall*, *Darbyshire*, *Torkshire*, *Cumberland*, *South-wales*, and about *New-castle*, can tell how certain and regular Nature is in this Case; for, although sometimes they meet with Difficulties in the first finding of a Vein, as when they meet with a small Sprig of a Vein, which often appears and vanishes again before they come to the main Body, yet, when once they have found the main Vein, between its firm Sides, they never lose such a Vein, without an apparent Reason above Ground, (as by some very deep Dingle or Valley) especially in Lead or Copper Mines, where the Veins lie perpendicular, or dipping downward; but for Horizontal Veins, as in *Cole* sometimes, a perpendicular Rock will cut its Vein in two, and thereupon the Vein may rise or fall on the other side, which is commonly called a Rise or Dip-dike; but ingenious Artists seldom fail to recover it again: But

Note.

in these Mines, they have been so fully tried from one end of the Hill to

the

the other, in several Places, that there is no room for that part of the Objection in this place.

And as to the other part thereof, it was never known, that the bottom of any fixed Veins of Lead or Copper, especially such large settled Veins, with firm Sides, was ever found, or the Works left off, till that the same were carried on as deep as the Water would permit; and any Person that is acquainted with Mines, can inform us, That it is not possible to work out these Veins with so deep a Level within the term of twenty one Years, especially since the Veins, still grow richer and wider as they grow deeper; but if it be considered, that the Mine of *Porózi* (not above six Foot wide in any place) has lasted from the Year 1546, with Twenty or Thirty thousand Men at work, that Objection must for ever cease.

Vide
Brown's
Travels to
the Mines
in Hunga-
ry, p. 98.

And now, upon the whole Matter, It is a wonderful thing to consider our *English* Merchants, (Persons of great Worth, Judgment, and Experience) what vast Sums of Money they will venture, view

the farthest Countries in the World, spread their Sails to the uttermost part of the Earth for Traffick ; how many Millions they have laid out in the *East-India* Trade, in building Forts, Castles, and Garrisons, maintaining Factories and Consuls, building vast Ships, and exposing all to the greatest Hazard of Pirates, Tempests, and Storms, and yet are easily diverted from venturing a small Sum at home in their own Nation, to improve a Trade from the growth of our own Country, though it would yield double the Profit, and far less of Hazard.

All the rest of the World are striving to engross Trade, and yet this at home remains neglected. This Trade of Lead and Copper, will, in some Years, be better known in *England*, and, its probable, it will hereafter be a Wonder to the Nation, that so vast a Treasure should be so long forgotten, and, without doubt, whoever happens to be so fortunate as to look into these things in time, before they grow too common, will have opportunity of great Bargains, and of raising vast Estates to their Families, and of bringing a Blessing on their Undertaking, by introducing and encouraging such a Trade,

as will employ many Thousands of poor People, and shift them from their Dens of Laziness, and, by hard Labour, fit them for the Service of their King and Country, either in time of War or Peace.

This Trade would conduce not only to the Advantage of particular Merchants, Tradesmen, and Labourers, and to the particular Countries, where the Mines lie, but of the whole Kingdom in a national Profit, by promoting a Foreign Trade to *Holland, France, Spain, Portugal, Italy, Turkey, the Indies, &c.* with the Commodities of our own Country, without exporting our Coin or Bullion out of the Nation: This would make Persons concerned therein, Merchants as well as Miners: *And, in short, would make England, not only the most delightful, but one of the strongest and wealthiest Kingdoms in the whole Christian World.*

A N

APPENDIX,

Concerning the

SILVER

That may be

Extracted out of these MINES.

I Presume, many Persons, especially those that were concerned under the Society of Royal Mines, may much admire that I have not, in my Essay, said one word of the Silver that may be extracted out of these Mines, especially, since so many Trials have been had, in *Westminster-hall*, about that very Point, and such Proofs made of the Richness of them in Silver, by great numbers of Witnesses upon Oath.

I must confess, some part of these Veins do yield Silver, for the great Vein lies in ridges or rows, like the Planks in a Floor, viz. One ridge of Potters Oar, (which is the richest of Lead Oar) and another of Silver Oar, which is poor in Lead, and rich in Silver; and I do not deny, but to the Owner, that has the Oar for nothing, tho' it is not rich enough to take it from him, since the late Act concerning Royal Mines, yet it is so rich, as that a considerable Profit may be made out of the same.

But, I do not think fit, at present, to enlarge upon this Subject, nor on the Method of doing thereof, nor disclose the Art of extracting Silver out of Lead, to the best Advantage, but shall be ready hereafter to communicate my Thoughts thereof as occasion shall require.

However, I presume, I may, without Prejudice, take notice, That Sir John Petrus, in his Treatise, call'd, *Fodina Regalis*, p. 10. demonstrates the Value of Goginian, Coomervin and Darrein Oar, that they yield in Silver *per Tun*, of Metal, fourteen Pounds, besides the Lead; but if the said Tun of Metal be made of the Oar of Coomsumbloch, it yields 20 *l. per Tun* in Sil-

Silver; and in pag. 33. he tells us, *That Sir Hugh Middleton undertook the Silver Mines in Cardiganshire, paying 400 l. per Ann. Rent to the Society of Royal Mines; and he cleared Monthly the Sum of 2000 l. and, had he not diverted his Gains to the making of the New-river from Ware to London, certainly he would have been Master of a Mass of Wealth; but great Wits and Pursets seldom know how to give Bounds to their Designments, and, by undertaking too many things, fail in all: And we may farther give Credit to the Beneficialness of those Mines, when as Mr. Tho. Bushel, by his Knowledge and Ingenuity, to work them to the best Advantage, did find Business enough there for a Mint, and, with the Product thereof, made Provision for the Cloathing of the late King's whole Army.*

All Persons that know these Mines, will agree, That we can raise more Silver Oar, from the Mines of Sir Carbery Price, than ever was raised from all the other Mines in Cardiganshire, and with far less Charges and Expences; but if Sir Hugh Middleton alone, with a small Stock, could make 24000 l. per Ann. and Mr. Bushel cloath a whole Army, What might not the present Partners do, if they were

were united, and would heartily joyn together, and raise a Stock answerable to so noble an Undertaking, especially since the Art of Extracting and Refining is much improved of late Years, and may be now done with far less Expence and wast of Lead? I believe we shall not be opposed by any, in case we should affirm, That these Mines, taking one part with another, are as rich in Silver as some of those above-mentioned; and though, at this Rate, these Mines would turn to no Account to the Patentees of Royal Mines, since the Price of the Oar will amount to more Mony than the clear Profits could be made thereof; yet, to the Proprietors of the Mines, and who have bought the same free from any Duty to the Lord, this Advantage in Silver will make a vast addition to the former Calculations of the Profit of the Lead only.

But I shall forbear to set it down in Figures, lest I should either raise too great an expectation on the one side, or frighten the World too much on the other, with the length of Numbers; for nothing displeases some Persons more than a Calculation that sounds so large as this would do, upon a modest Computation, though

though I cannot see any other Method so secure in order to fix a right Judgment thereof.

For, though some incident Charges may possibly happen hereafter, by ill Management that cannot be thought of at present; yet, by this way, you may demonstrate the true Value so near the Matter, that if reasonable Allowances be made for such Contingencies, a Man cannot easily be mistaken; but, for this, I shall not only referr you to what is done in the present Age, at *Potoxi*, above-mentioned, (and I might instance in many other Places) but I will endeavour to open the Eyes of those that are Strangers to these things, by letting them also see the Sense of Antiquity on this Matter, and that this is no new Method.

For, *Xenophon*, an ancient Greek Author, of undoubted Credit, (lately Translated by *W. M.*) and Dedicated to the ingenious Author of the Essay on Ways and Means, speaking of the Improvement of the Revenue of *Athens*, and more particularly on their Silver Mines, goes on thus, (*viz.*) *Our Silver Mines alone, if rightly managed, besides all the other Branches of our Revenue, would be an*

in-

inestimable Treasure to the Publick: But, for the benefit of those who are unskill'd in Inquiries of this nature, I design to premise some general Considerations upon the true State and Value of our Silver Mines, that the Publick, upon a right Information, may proceed to the taking such Measures and Councils as may improve them to the best Advantage.

No one ever pretended from Tradition, or the earliest Accounts of Time, to determine when these Mines first began to be wrought, which is a Proof of their Antiquity; and yet, as ancient as they are, the heaps of Rubbish, which have been dug out of them, and lie above Ground, bear no Proportion with the vast Quantities which still remain below, nor does there appear any sensible Decay, or Diminution in our Mines; but, as we dig on, we still discover fresh Veins of Silver Oar in all parts, and when we had most Labourers at work in the Mines, we found that we had still Business for more Hands than were employed.

Nor do I find that the Adventurers in the Mines, retrench the Number of their Work-men, but purchase as many new Slaves as they can get; for their Gains are greater or less in proportion to the Number of
 G Hands

Hands they imploy. And this is the only Profession I know of, where the Undertakers are never envied, be their Stock or Profits never so extraordinary, because their Gains never interfere with those of their Fellow-traders.

Every Husbandman knows how many Toak of Oxen and Servants are necessary to Cultivate his Farm; and if he imployes more than he has occasion for, reckons himself so much a loser; but no Dealer in the Silver Mines ever thought he had Hands enough to set to work.

For there is the Difference between this and all other Professions, That, whereas, in other Callings, for instance, Braziers and Blacksmiths, when their Trades are overstock'd, are undone, because the Price of their Commodities is lower'd of course, by the multitude of Sellers: And, likewise, a good Tear of Corn, and a plentiful Vintage, for the same Reasons, does hurt to the Farmers, and forces them to quit their Employments, and set up Publick-houses, or turn Merchants and Bankers.

But here the Case is quite otherwise, for the more Oar is found, and the more Silver is wrought, and made, the more Adventurers come in, and the more Hands are imployed in our Mines.

A Master of a Family, indeed, when he is well provided with Furniture, and Household-goods, buys no more; but no Man was ever so over-stock'd with Silver, as not to desire a farther increase: If there are any who have more than their Occasions require, they hoard up the rest with as much pleasure, as if they actually made use of it.

And when a Nation is in a flourishing condition, no one is at a loss, how to employ his Money; the Men lay it out in fine Armour, and in magnificent Houses and Buildings; Women lay it out in great Equipage, costly Habits, and rich Cloaths.

And, in accidents of War, when our Lands lie fallow and uncultivated, or in a publick Dearth and Scarcity, What Reserve have we left to apply to, but Silver to purchase Necessaries for our Subsistence, or hire Auxiliaries for our Defence?

I have insisted the longer upon these general Reflections, to encourage Adventurers of all kinds, to employ as many Hands as possible in so advantageous a Trade, from these plain Considerations, That the Mines can never be exhausted, nor can Silver ever lose its Value.

But to draw this Discourse more immediately to the Subject of my present Consideration,

ration, which is the Maintenance of our Citizens, I will begin to propose those Ways and Means, by which the Silver Mines may be improved to the highest Benefit and Advantage to the Publick; nor do I set up for the Vanity of being admired for an Author of new Discoveries, for that part of my following Discourse, which relates to the Examples of the present Age, lies obvious to all the World; as for what is past, 'tis a Matter of Fact, and every Man might inform himself, that would be at the pains of enquiring.

'Tis very strange, that after so many Precedents of private Citizens of Athens, who have made their Fortunes by the Mines, the Publick should never think of following their Example; for we who have made inquiry into this Matter, have heard, That Nicias, the Son of Niceratus, had a thousand Slaves, employed in the Mines whom he let out to Solias, the Thracian, upon Condition to receive an Obolus a Day, clear of all Charges, for every Head, and that the same Complement of Work-men should be always kept on foot.

In like manner, Hipponicus had six hundred Slaves let out at the same Rate, which yielded him a Revenue of a Mina a Day; and

and Philemonides three hundred, which brought him in half a Mina a Day; and many others made the same Advantage, in proportion to the number of Slaves they possessed: But what need we to appeal to Precedents of an elder Date, when, at this Day, we have so many Instances of the same nature before our Eyes?

Twelve hundred Slaves, when bought, will probably, in five or six Tears time, produce a Revenue sufficient to purchase as many more as will make the number six thousand. This number, at the rate of an Obolus a Day, a Head, clear of all Charges, will afford a yearly Revenue of sixty Talents; and if but twenty of these Talents are laid out in the Purchase of more Slaves, the City may employ the Over-plus as they think convenient, and when the number of Slaves is increased to ten thousand, it will produce a standing Revenue to the Publick, of A hundred Talents a Year.

To demonstrate, that the Mines would take up a greater proportion of Slaves to work 'em, I appeal to the Authority of all those living Witnesses, who remember what numbers of Workmen were employed in them, before the taking of Declea, by the Lacedaemonians, and our Silver Mines that have
been

been wrought for so many Ages, with such numbers of Hands; and continue still so far from being drained or exhausted that we can discover no visible difference, in their present State from the Accounts our Ancestors have delivered down to us, are undeniable Proofs of my Assertion.

And their present Condition, is a good Argument, that there never can be more Hands at work in the Mines than there is employment for; for we dig on still without finding any bottom or end of our Mines or decay of the Silver Oar.

And Companies of private Adventurers may carry on the same Trade in a Joint Stock, nor is there any danger that they and the national Company will interfere one with another, but, as Confederates, are strengthen'd by their mutual assistance to each other; so the more Adventurers of all kinds are employed in the Mines, so much larger will the Gains and Advantage be to all.

And thus you see that these Calculations of mine are no new things, but very obvious to the meanest capacity, and commonly practised in all Ages and Countries; and there can be no reason to doubt but that these Silver Mines in Wales might prove as rich as those in Athens or in Hun-

gary,

gary, if carried on with a large Stock, and would not be exhausted in many Ages; and one Reason I have (amongst several others) to be of this opinion is this, That all great Veins of this nature are in some respect like a great large spreading Oak, and hath a great number of Branches, which, like Bows of a Tree, shoot out from the Body of the Vein, insomuch that when a considerable Sum of Mony is gained out of the same, and many Years spent in the working thereof, so that Persons would naturally be apt to think that the Vein was almost work'd out, there is still discovered fresh Veins shooting forth from the sides thereof, which are innumerable and scarce ever to be exhausted. This was the Case at *Athens, Hungary* and other places, and would be found the same in *Wales*, if enquired into. Nature is the same in all places; and though some accidental Variations may happen, between Mines in one Country and another, yet they do not vary in substance; and 'tis by these Branches that the great Body of the Vein is fed and brought to so large a Bulk; you may as well see a large Oak without Roors and Boughs,

*The Mine
at Chren-
nitz in
Hungary,
has been
wrought
950 Years.
Brown's
Travels.*

Boughs, as a large Mine without these Branches: Small Veins have many small Twigs, which being too little to work, are passed by without much notice, as Unprofitable and Useless; but you will find that many Branches of this great Vein will be as large as most Veins now known in the North of *England*: In other Countries they would know how to value such Mines as these, where they have Pits or Shafts three hundred Yards deep, as *Brown*, in his Travels to the Mine-towns in *Hungary*, informs us, p. 98. where he says, that at the Mine at *Chremnitz*, he went down by the Pit called by the Name of the Emperour *Rodolphus's* Shaft, gently descending by the turning about of a large Wheel, to which the Cable is fastned, a hundred and eight Fathoms deep into the Earth, and after many Hours being in the Mine, was drawn out again by *Leopold's* Shaft, streight up, above a hundred and fifty Fathoms; a Height surpassing that of the Pyramids by a third part. And yet in these Parts we will scarce be invited to lay out our Mony upon a rich Mine, though it appears at the Day upon the very Surface of the Ground:

The Fortunate have Hours, and those they choose;

The Unfortunate have Minutes, and those they lose.

I shall conclude with the Words of Sir John Pettus, who saith, fol. 5. as followeth, viz. Besides the Enjoyment of the Metals and Minerals digged from the Earth, the Benefit to the Nation is great; for, in the Book of Rates, we shall find above two hundred Particulars of ingrown Metals and Minerals, which do afford great Customs to the Crown, and would do much more, if the Management from their original Vent were daily inspected. And, in fol. 34. he says, That it might be added, with submissive Confidence, that with due Care herein, we might give Law to all Europe, as to all Utensils of Metals, whether considered Domestic or Publick, Civil or Martial.

And the Advantages being so, we may justly infer, that by the not duly and carefully managing of this Affair, the Disadvantages are in the same degrees as much prejudicial to the Interest of this Kingdom, as the due Use of them would be profitable. For it is

H clearly

clearly demonstrable, that every Year, for many Tears past, this Kingdom hath, by Negligence herein, lost a Million of Money, which, by Vigilance, they might have saved, whereby we want when others abound with our Natural Store.

C O N

CONCLUSION

T O

All the P A R T N E R S.

AND thus as I began, so I beg
leave to conclude this little Trea-
tise under your Patronage and
Protection.

I must confess, much more might be
said on so fruitful a Subject; but you
will consider, that I was brought up a
Miner, and not an Orator; my Business
is to demonstrate the Truth in as few
Words as I can, not to put a Varnish up-
on it, and to Write, not what may be
said, but what may be done.

And now, in order to the Accomplish-
ment of what I have Writ, I have but
one thing more to offer to your Considera-
tions, and that is of such a Nature, as I

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know

know will be very pleasing and agreeable to you, *viz.* That the Poor may have some small Share with you in so rich a Treasure, especially the poor Miners and Labourers; That when they have spent their Lives to make you Rich, and are grown Impotent, and unable to Work, either through Age or Accident, they may have a comfortable Subsistence provided for them.

This will bring a Blessing from Heaven on your Undertakings, and encourage the most skilful Miners (and at lower Rates) to resort to that Work, where they shall be provided for in their old Age, and against all Accidents.

And this will tend to no small Advantage of all the Partners concerned, who will every Year save more by cheap Bargains, than the Charity will amount unto; and, in this case, every Miner will have an Interest in the Works, and will be as careful thereof, as if they were his own. Your Works will never be in want of able Miners, or in danger of being lost either by Neglect or Treachery; you may then be truly called the

FRIEND.

FRIENDLY SOCIETY OF MINERS,
and fear no Combination to destroy your
Works.

'Tis wonderful to observe how punctual and exact Xenophon was to engage a Divine Assistance in the like case, whose Words are these:

And if the Publick, upon due consideration, think fit to execute these Orders and Institutions, I would advise them to send Ambassadors to Delphi, and Dodona, to consult the Gods, whether such a Reformation of our Government would not turn to the Advantage of the present Age, and the benefit of all Posterity.

And if these Resolutions are ratify'd by the Divine Approbation, to consult the Oracle once more, to the protection of what Gods we should recommend the Success of this Enterprize, and then to propitiate those Gods we are directed to apply to, in order to engage their Assistance; and, after this solemn Invocation, to enter boldly upon the Execution of this Design; for 'tis but reason that all Undertakings should be attended with more favourable Success, that are begun, and carried on, under the immediate Care and Protection of Divine Providence.

Me-

Method, 'tis great Pity that *Xenophon* was not a Christian, and as great a Shame that there should be so many Christians who have not the Devotion of *Xenophon*.

Who can admire that Mines are sometimes unsuccessful, when Men presume to dig out the very Bowels of the Earth, enter into the Secrets of the Deep, and rifle the choicest Cabinet of Nature, without so much as consecrating the least part thereof to Pious and Charitable Uses?

And, on the other side, who can doubt Success in any thing Sir *Humphry Mackworth* undertakes? When his Designs appear so generous to his Partners; so charitable to the Poor, and so much conducing to the Publick Good? And it is my hopes and belief that his Example, and good Success in this Undertaking, will be a Means to encourage others to do the like, and to follow such a Precedent as may in time extend to make a Provision for all the Poor of *England*.

And therefore, that he may not be diverted from so good a Design, but may receive Encouragement from you to continue

tinue steadfast to his former Resolutions,
and labour now for the Poor, who will
hereafter labour for you: And that you
may all, not only obtain a Temporal, but
an Eternal Treasure, that can never be
exhausted, is, and always shall be, the
Prayers of,

YOUR HONORS

Most Obedient, and most Humble

Servant to Command,

WILLIAM WALLER.